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AUTHOR Nihira, Kazuo
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ABSTRACT

The Adaptive Behavior Scale (ABS) is a behavior rating instrument designed to provide information about the way mentally retarded individuals maintain their personal independence in daily living and how they meet the social expectations of their environment. This study attempted to explore the existence of typology of retardates based upon their profile of scores on these two dimensions of adaptive behavior as measured by the ABS. Nine hundred and fifty-one retardates, ages 18-68, were rated by psychiatric aides in two midewestern state institutions. The BC TRY System of Cluster and Factor Analysis identified seven distinct sub-groups of individuals with similar score profiles on the two dimensions. A cross tabulation of individuals in terms of the American Association on Mental Deficiency etiological classifications and the seven sub-groupings was carried out. Conclusions indicated trends which suggest a possible relation between the behavioral typology and etiological classifications. More research is suggested and is viewed as possibly offering fruitful hypotheses in the formulation and evaluation of training and rehabilitation programs. (TL)

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PERSON-CLUSTERS IN TWO DIMENSIONS OF ADAPTIVE BEHAVIOR

Kazuo Nihira
Neuropsychiatric Institute
UCLA

In the past, mentally retarded individuals have been identified and classified primarily on the basis of their intelligence quotients. While the I.Q. score has some value in assessing the academic potential of average or above average persons from middle class ~~white~~ communities, it does not provide a vivid description of the way the individual maintains his personal independence in daily living or how he meets the social expectations of his environment. Let me emphasize that the objective and vivid behavioral description of handicapped individuals is the very information most crucial for those in charge of training and rehabilitation. The Adaptive Behavior Scale is a behavior rating instrument designed to provide this type of information. The scale was developed as a result of a five-year research project under the sponsorship of the American Association on Mental Deficiency.

Part 1 of the scale was designed to provide assessments of the individual's skills and habits in ten behavior domains of personal independence (see handout for a summary description of the scale). Part 2 of the scale consisted of 13 behavior domains of maladaptive behavior in the areas of personality and behavior disorders.

EXAMPLE 1

EATING IN PUBLIC: Select the one statement that best describes the child's use of table utencils.

6	Uses knife and fork correctly and neatly
5	Uses table knife for cutting or spreading
4	Feeds self with spoon and fork - neatly
3	Feeds self with spoon and fork - considerable spilling
2	Feeds self with spoon - neatly
1	Feeds self with spoon - considerable spilling
0	Feeds self with fingers or not at all

EXAMPLE 2

TABLE MANNERS ARE COMPLETELY ACCEPTABLE:

Check "Yes" or "No". If "No", select all statements that apply.

a.	Swallows food without chewing
b.	Chews food with mouth open
c.	Drops food on table or floor
d.	Does not use napkins correctly
e.	Other

In some questions, the raters are asked to designate whether the given behavior is observed not at all, occasionally, or frequently.

I have reported in previous publications the results of a series of factor analyses of the domain scores. Two salient dimensions have emerged repeatedly in four separate factor analyses using a population of institutionalized retardates of various age ranges.

The first dimension, Personal Independence, was defined primarily by the ten domains in Part 1 of the Adaptive Behavior Scale. These domains represent the individual skills and abilities required to maintain personal independence. Some of the Part 1 domains suggest the presence of autonomy or motivation to manage his personal affairs. This dimension has some resemblance to the traditional notion of social competency in the Vineland Social Maturity Scale.

The second dimension, Social Maladaptation, is defined by some of the behavior domains in Part 2 which refer to extra-punitive, anti-social behavior problems.

The present study attempts to explore the existence of typology of retardates based upon their profile of scores on these two dimensions of adaptive behavior. It also investigates the relationship between the behavior typology and etiological classification.

Subject:

The subjects were 951 retardates comprising most of the residential population, ages 18 to 68 years in two midwestern state institutions for mentally retarded. The subjects were rated by day-shift psychiatric

aides assigned to the patients ward or cottage. The subject's I.Q.s included the entire range of mental retardation, although moderate, severe and profound levels were heavily represented.

Typological Analysis:

The BC TRY System of Cluster and Factor Analysis was used to obtain clusters of individuals with similar score profiles on the two dimensions of adaptive behavior. The first step of this method is to compute factor scores for each individual on the two dimensions using orthogonal regression estimates. The method then allocates all individuals to natural clusters of individuals by the iterative process on the basis of the Euclidean distance between the individuals. The objective of this procedure is to classify a large number of individuals into a smaller number of clusters. In each cluster, the individuals have a similar profile of scores across the given number of dimensions. The procedure is designed to establish empirically determined behavioral typology by separating all individuals into a number of functionally homogeneous groups.

In the present study, the final solution allocated the subjects into seven distinct sub-groups, with the exception of 20 individuals. The score profiles of these 20 individuals were so deviant that they could not be classified into any of the seven empirically derived sub-groups.

In Table 1, the first column is a list of the seven sub-groups; the second column lists the number of individuals allocated to each of

the seven sub-groups; the third and fourth columns list means and standard deviation of factor scores for each of the sub-groups. The factor scores are expressed in terms of Z-scores having a common mean of 50 and a standard deviation of 10. Figure 1 is a graphic illustration of the means of sub-groups in profile form. If one looks at the distribution of means of Personal Independence, he will see three distinct groups instead of seven sub-groups. Sub-groups 1 and 2 being lower range; sub-groups 3, 4, and 5 being middle range; sub-groups 6 and 7 being higher range.

If you observe the distribution of Mean I.Q. in Table 1, it is obvious that Personal Independence is moderately correlated with I.Q. dimension.

Each of the seven sub-groups has a unique pattern of profile in the two dimensional system of classification. For example, the sub-groups 3, 4, and 5 are about equal level on Personal Independence, yet they have widely different mean scores on the dimension of Social Maladaptation. Sub-group 5 has the highest mean score on Social Maladaptation indicating a high degree of personality and behavior disorders. This result seems in agreement with a separate psychiatric diagnosis. In the last column of Table 1, it can be seen that 33.9% of the individuals in sub-group 5 have been previously diagnosed as having "psychiatric impairment", which is a higher incidence than in any of the other sub-groups. The psychiatrically impaired individuals consist of those who were classified as having "Behavioral reaction", "neurotic reaction " or "psychotic reaction"

according to the AAMD classification manual. These psychiatric diagnoses were given independent of the ratings on the Adaptive Behavior Scale.

It should be noted that two additional profile types, i.e., low personal independence and high social maladaptation; and high personal independence and high social maladaptation were not identified in this analysis. The lack of low ability and high social maladaptation type is because some of the measures in social maladaptation,(e.g., anti-social, rebellious and untrustworthy behaviors) do pre suppose certain basic skills and abilities in physiological and language development and awareness of value of money, property and rights of others. Therefore, it seems unlikely that the low-high profile type exists in any population. The lack of high-high profile type, i.e., high ability and high social maladaptation type, probably belong in correction agencies or prisons but not in the residential institution for mentally retarded.

Clinical meanings of these sub-groups remain to be explored. It may or may not be related to other psychological, neurophysical or etiological variables. Table 2 presents a cross-tabulation of individuals in terms of AAMD medical classification and the seven sub-groupings. This is an attempt to explore the possible correspondence between the behavioral typology and etiological diagnosis. Information concerning the medical classification was available for only 494 individuals at the time this study was conducted.

Medical classification is presented in terms of five major categories: 1) Mental retardation due to pre and postnatal cerebral infection (110, 120), prenatal injury (310), Mechanical injury at birth (320), Anoxemia at birth (330), and Postnatal injury (340); 2) Mongolism (640); 3) Mental retardation due to congenital cerebral defect (610), cranial anomaly such as craniostenosis, Hydrocephalus, Macrocephaly (620), and due to other unknown prenatal influences (690); 4) Mental retardation due to uncertain cause with the structural reaction manifest (780, 790); 5) Functional mental retardation, specifically, cultural - familial *810), mental retardation associated with major personality disorder such as autism (840) and, mental retardation due to unknown cause with the functional reaction (890).

The overall Chi Square of Table 2 is highly significant (Chi Square = 78.68; $\alpha < .001$). Figure 2 indicates the degree of contribution of each cell to the total Chi Square in Table 2. For example, the degree of positive association between Group 1 and the etiological classification 4 is indicated by the cell Chi Square value of 11.2. The degree of negative association between Group 5 and the etiological classification 1 is indicated by the cell Chi Square value of 4.5.

Two most significant contributions to the overall Chi Square value come from 1) the association between Profile group 3 and Mongolism, etiological classification 2; and 2) the association b etween Profile group 1 and the etiological classification 4, i.e., mental retardation due to postnatal disease and conditions where the structural reaction is manifest but where the etiology is unknown or uncertain.

Profile group 3 has exceptionally high (24%) of Mongolism as compared to other etiological classifications. In fact, about 40% of the cases of Mongolism are classified to Profile group 3. A behavioral profile of this group can be characterized as moderately ability and very low social maladaptation. This profile patterns seems to coincide with the commonly accepted picture of Mongoloids as having amicable personalities at moderate or severe levels of intellectual retardation.

Profile group 1, low ability and low social maladaptation, is a behavior pattern of profoundly retarded individuals. This profile group is also associated with etiological classification 1, i.e., pre and postnatal infection and trauma.

Profile group 2, low ability and medium degree of social maladaptation, is associated with the etiological classification 3, i.e., various congenital cerebral defects of undetermined etiology, and cerebral defects associated with cranial anomaly such as craniostenosis, hydro and microcephalus.

Profile group 4, medium-medium group, seems to be associated with the etiological classification 3 but, associated negatively with the etiological classification 4, i.e., the postnatal disease and conditions where the structural reaction is manifest but where the etiology is unknown.

Profile groups 5 and 6, i.e., medium-high and high-low groups, are both associated with the etiological classification 5, i.e., functional retardation. Furthermore, Profile group 5 seems to be negatively

associated with the pre and postnatal infection and trauma, the etiological classification 1.

Profile group 7, high-medium group, does not seem to have notable association with any of the etiological classifications.

Conclusion:

The crudeness of etiological categories used in this analysis may have obscured the existing relationship. However, there are some trends which suggest a possible relation between the behavioral typology and etiological classification.

What ever the clinical meaning of the behavioral typology, the fact remains that themember of each sub-group is functionally homogeneous in terms of the two dimensional meas ures of adaptive behavior. The existence of these different behavior types seems to suggest a need for differential rehabilitation programs . Most of the behavior modification programs are based solely upon the functional analysis of behavior patterns of the individual subject. In the past we have not given a sufficient attention to the differential responses between the subjects to a given behavior modification program. The development of refined behavior typology and its relation to other psychological, neurophysiological, and etiological variables may offer fruitful hypothesis in the formulation and evaluation of training and rehabilitation programs.

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Table 1

Behavioral Typology	N	Personal Independence Means	Personal Independence SD	Social Maladaptation Means	Social Maladaptation SD	Homogeneity Index	Mean Age	Mean I.Q.	Psychiatric Impairment
Group 1	199	38.7	3.0	44.3	3.0	.95	37.2	13.7	12.1%
Group 2	67	35.0	3.7	56.1	4.9	.90	39.9	13.5	17.9%
Group 3	161	51.0	3.3	43.8	2.8	.95	35.6	34.5	14.8%
Group 4	114	47.4	3.2	53.6	3.9	.93	35.9	34,4	21.0%
Group 5	59	49.1	6.0	72.7	5.4	.82	37.6	42.8	33.9%
Group 6	236	61.2	3.3	44.1	2.9	.95	33.4	53.0	21.2%
Group 7	95	59.9	3.5	57.6	4.9	.91	32.5	53.5	29.5%

FIGURE 1

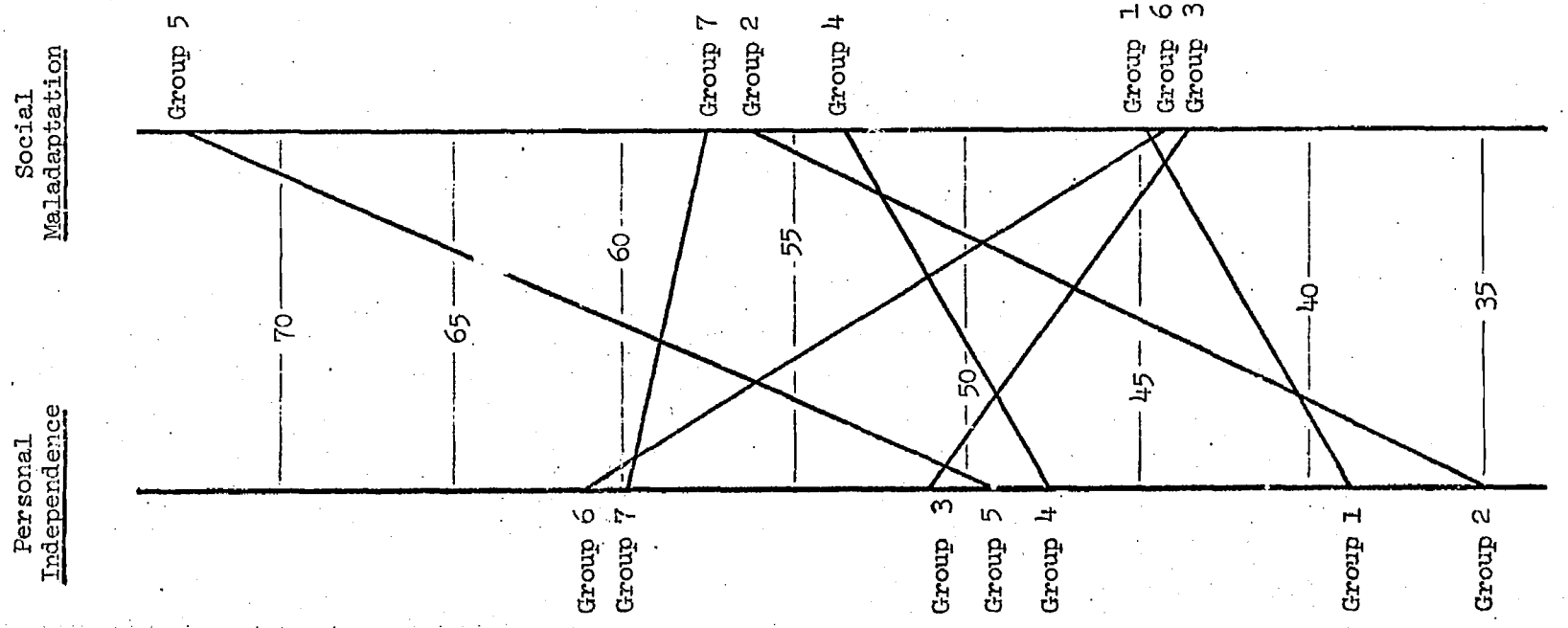

TABLE 2

AAMD Etiological Classification	Behavioral Typology							
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Total
1. Infection Trauma	31	9	15	16	2	14	6	93
2. Mongolism	9	4	21	3	5	5	4	51
3. Congenital Cerebral Defects	8	6	4	8	1	4	0	31
4. Structural Reaction Manifest	21	2	5	1	1	6	4	40
5. Functional Reaction Alone	53	15	39	30	32	66	25	260
Total	122	36	84	58	41	95	39	475

Chi Square = 78.68 ($\alpha < .001$)

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1. Prenatal and postnatal infection, trauma or mechanical injury at birth (AAMD [redacted] 11, 12, 31, 32, 33, 34)

2. Mongolism (AAMD 64)

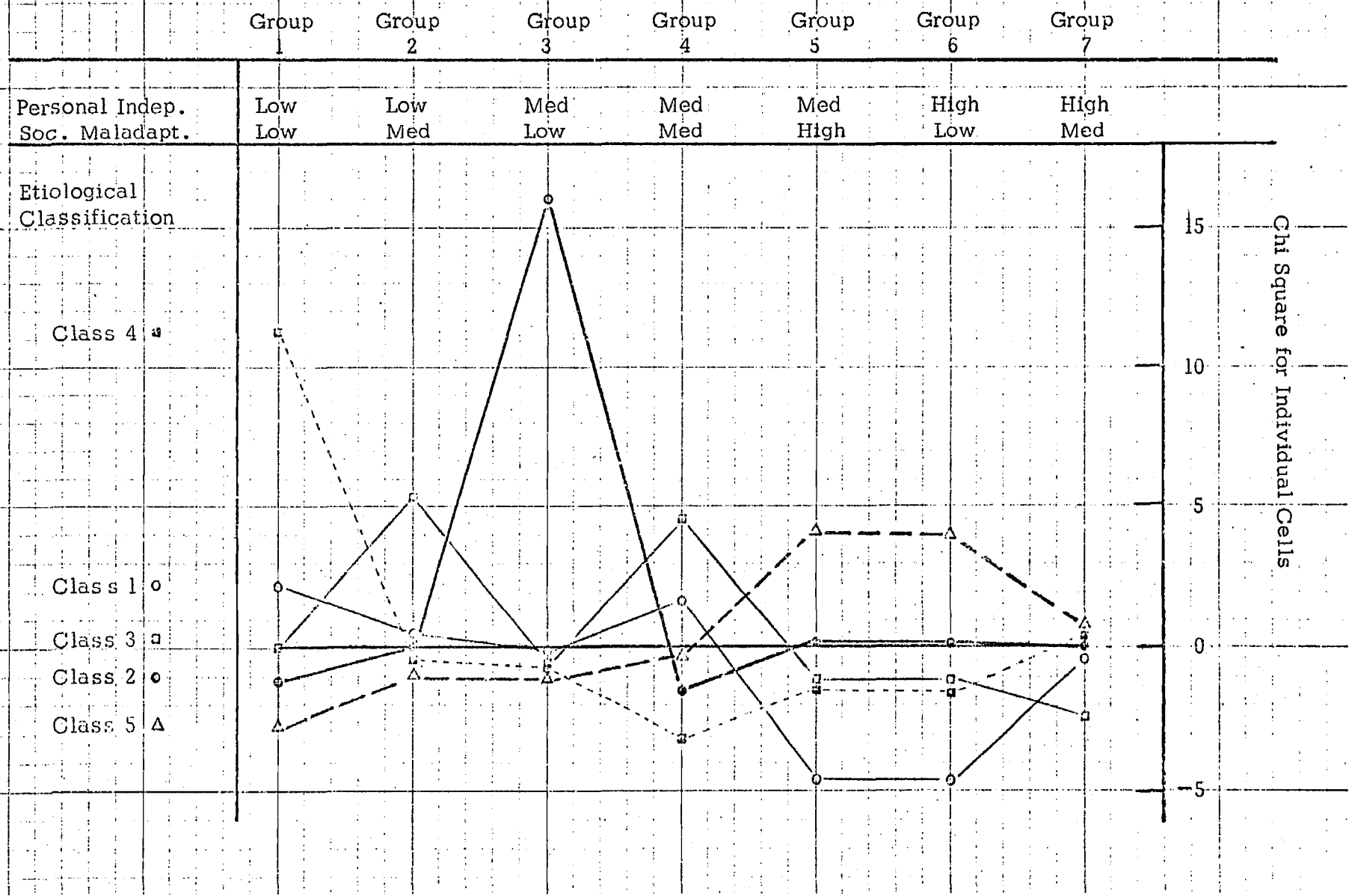
3. Congenital cerebral defect, cerebral defect associated with primary cranial anomaly, and other due to unknown prenatal influence (AAMD 61, 62, and 69)

4. Encephalopathy associated with prematurity, and other due to uncertain cause with structural reaction manifest (AAMD 78 and 79)

5. Cultural-familial retardation, M.R. associated with major personality disorder, andother due to uncertain cause with factional reaction alone manifest (AAMD 81, 84 and 89).

Figure 2

Behavioral Typology



APPENDIX B

Summary of Adaptive Behavior Check List (Form 3)

Part I

		No. of Items
I.	Independent Functioning	
A.	Eating Skills	
1.	Use of utensils	7
2.	Eating in public	4
3.	Drinking	4
4.	Table manners	5
B.	Toilet Use	
1.	Toilet training	5
2.	Toilet care	6
C.	Cleanliness	
1.	Washing hands and face	4
2.	Prepares and takes bath	6
3.	Keeps self clean	5
4.	Teeth brushing	6
5.	Menstruation	6
D.	Appearance	
1.	Posture	7
2.	Appearance of clothing	7
3.	Hair style and makeup	4
E.	Care of Clothing	5
F.	Dressing and Undressing	
1.	Dressing	5
2.	Undressing	5
G.	Locomotion	
1.	Sense of direction	4
2.	Use of vehicles	4
3.	Use of public transportation	4
H.	General Independent Functioning	
1.	Use of telephone	4
2.	Miscellaneous independent functioning (general)	7
II.	Physical Development	
A.	Sensory Development	
1.	Vision	4
2.	Hearing	4
B.	Motor Development	
1.	Body balance	7
2.	Body movement	5
3.	Hand control	4
4.	Spasticity	4
III.	Economic Activity	
A.	Money Handling and Budgeting	
1.	Money handling	5
2.	Budgeting	4
B.	Shopping Skills	
1.	Errands	5
2.	Purchasing	6
IV.	Language Development	
A.	Speaking and Writing	
1.	Writing	6
2.	Primitive expression	5
3.	Clarity of speech	4
4.	Sentences	4
5.	Vocabulary	5
B.	Comprehension	
1.	Reading	6
2.	Understanding instructions	3
C.	Social Conversation	3
D.	Language Development (general)	8
V.	Number and Time Concept	
A.	Number Concept	6
B.	Time Concept	5
C.	Number and Time Concept (general)	3
VI.	Occupation Domestic	
A.	Cleaning	
1.	Room cleaning	3
2.	Clothes cleaning	3

	B.	Kitchen Duties	
		1. Table setting	4
		2. Table clearing	3
		3. Food preparation	4
	C.	Occupation Domestic (general)	4
VII.	Occupation General		
	A.	Work Fitness	3
	B.	Job Performance	4
	C.	Work Habits	5
VIII.	Self-Direction		
	A.	Sluggishness in Movement (H-1)	3
	B.	Initiative (V-A-1 & H-2)	8
	C.	Persistence (V-A-2 & H-3)	9
	D.	Planning and Organizing (V-B)	3
	E.	Self-Direction (general)	6
IX.	Responsibilities		
	A.	Responsibility for Personal Belongings	4
	B.	Responsibility (tasks)	4
X.	Socialization		
	A.	Is Cooperative	4
	B.	Is Considerate of Others	4
	C.	Has Knowledge of Those Around Him	4
	D.	Interaction with Others	4
	E.	Participation in Group Activities	4
	F.	Is Selfish	5
	G.	Has Other Immaturities in Socialization	6

Part II

A. Violence and Destructive Behavior

1.	Threatens or Does Physical Violence	10
2.	Is Destructive	6
3.	Has Violent Temper or Temper Tantrums	4
4.	Other Destructiveness	3

B. Anti-Social Behavior

1.	Teases or Tattles on Others	5
2.	Bosses and Manipulates Others	5
3.	Interferes with or Deliberately Blocks Others' Activities	5
4.	Is Inconsiderate of Others	4
5.	Does Not Respect Others' Property	4
6.	Uses Profane of Hostile Language	4

C. Rebellious Behavior

1.	Ignores Regulations or Regular Routines	6
2.	Resists Following Instructions, Requests or Orders	5
3.	Has an Impudent or Rebellious Attitude Toward Authority	5
4.	Is Absent From or Late to School, Work Ward (Home) or Other Activities	4
5.	Runs Away or Attempts to Run Away	4
6.	Misbehaves in Group Setting	4

D. Untrustworthy Behavior

1.	Takes Others' Property Without Permission	4
2.	Lies or Cheats	5

E. Socially Unacceptable Manners

1.	Has Disturbing Vocal or Speech Habits	6
2.	Has Mannerisms that are Unpleasant or Inappropriate	8

F. Withdrawal

1.	Is Profoundly Withdrawn and Inactive	5
2.	Is Profoundly Withdrawn but Active	5
3.	Is Socially Extremely Shy (X-G)	4

G. Stereotyped Behavior

1.	Has Hyperactive Tendencies	4
2.	Has Stereotyped Behaviors	8
3.	Has Peculiar Posture or Odd Mannerism	5

H. Self-Abusive Behavior

1.	Does Physical Violence to Self	7
2.	Removes or Tears Off Own Clothing	5

I. Peculiar and Eccentric Habits

1.	Has Peculiar or Unacceptable Oral Habits	5
2.	Has Peculiar or Unacceptable Habits	6
3.	Has Other Eccentric Habits and Tendencies	5

J. Sexually Aberrant Behavior

1.	Engages in Inappropriate Masturbation	3
2.	Exposes the Body Indecently	3
3.	Has Homosexual Tendencies	3
4.	Has Heterosexual Behavior that is Socially Unacceptable	8

K. Psychological Disturbances

1.	Tends to Over-Evaluate his Own Abilities	3
2.	Reacts Poorly to Criticism	4
3.	Reacts Poorly to Frustration	4
4.	Demands Excessive Attention or Praise	4
5.	Seems to Feel Persecuted	6
6.	Has Hypochondriacal Tendency	3
7.	Has Other Signs of Emotional Instabilities	10

L. Supplementary Information

1.	Need for Medication	4